UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/778,087	02/07/2001	Takahiro Ishikawa	1538.1010	4567

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EXAMINER
YIGDALL, MICHAEL J

ART UNIT	PAPER NUMBER
2192	

DATE MAILED: 06/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/778,087	ISHIKAWA ET AL.
	Examiner	Art Unit	
	Michael J. Yigdall	2192	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 February 2005*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

 4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

 a)☐ All b)☐ Some * c)☐ None of:

 1.☐ Certified copies of the priority documents have been received.

 2.☐ Certified copies of the priority documents have been received in Application No. _____.

 3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

 * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1.   A request for continued examination under 37 CFR 1.114, including the fee set forth in

37 CFR 1.17(e), was filed in this application after final rejection. Since this application is

eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e)

has been timely paid, the finality of the previous Office action has been withdrawn pursuant to

37 CFR 1.114. Applicant's submission filed on December 13, 2004 has been entered. Claims 1-

12 are pending.

2.   It should be noted that the amendment to the claims filed on December 13, 2004 does not

comply with the requirements of 37 CFR 1.121(c) because claim 7, which is currently amended,

is labeled as "original" in the claim listing.

Response to Arguments

3.   Applicant's arguments have been fully considered but are moot in view of the new

ground(s) of rejection.

4.   Furthermore, Applicant's arguments with respect to Martin are not persuasive.

Applicant notes that in Martin, the compiler ignores the comments and the pre-compiler

generates the directives, and contends that the comments and the directives do not contain the

class-type variable (Applicant's remarks, page 7). Applicant further suggests that in Martin, the

pre-compiler extends the constructor code for the class rather than generating an instruction to

call a construction instruction routine (Applicant's remarks, page 8).

However, Martin expressly discloses that the comments are included in the source code

(see, for example, column 7, lines 34-39). The comments are specifications for parallelization

and are thus parallelization directives (see, for example, column 7, line 50 to column 8, line 5).

The pre-compiler generates "directives to the compiler" based on the comments or parallelization

directives included in the source code (see, for example, column 8, lines 54-63). The source

code also includes class-type variables (see, for example, column 7, lines 34-39).

As set forth below, Meyer discloses generating an instruction to call a construction

instruction routine when a class-type variable is contained in an execution statement to be

distributed and executed over a plurality of processes (see, for example, for example, column 10,

lines 14-35, and column 5, lines 28-45), and the rejections are based on a combination of Meyer

and Martin. It should be noted that one cannot show nonobviousness by attacking references

individually where the rejections are based on combinations of references. See *In re Keller*, 642

F.2d 413, 208 USPQ 871 (CCPA 1981) and *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375

(Fed. Cir. 1986).

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

6.   Claims 1-3, 5-7 and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over

U.S. Pat. No. 5,684,955 to Meyer et al. (art made of record, "Meyer") in view of U.S. Pat. No.

6,438,746 to Martin (art of record, "Martin").

With respect to claim 1 (currently amended), Meyer discloses a compiler embodied on a

medium to compile a source program in an object-oriented programming language (see, for

example, the abstract), said compiler comprising:

(a) when a class-type variable is contained in an execution statement to be executed in

parallel or in a parallelization directive, said execution statement to be executed in parallel or

said parallelization directive originally included in said source program (see, for example,

column 5, lines 28-45, which shows class-type variables in the source code of an object-oriented

program to be distributed and executed over a plurality of processes, and column 6, lines 1-10,

which shows that the source code may include calls or directives for the distribution), generating

an instruction to call a construction instruction routine for an object of the class, before said

execution statement, in order to generate said object in addition to an original object of the class

(see, for example, column 9, lines 38-46, which shows stub objects in addition to the original,

real objects, and column 10, lines 14-35, which shows generating an SX_NEW instruction to call

an instantiation function, i.e. a construction instruction routine, to generate the objects before

execution); and

(b) when a class-type variable is contained in said execution statement to be executed in

parallel or in said parallelization directive, generating an instruction to call a destruction

instruction routine for the generated object of the class, after said execution statement, in order to

destruct the generated object in addition to said original object of the class (see, for example,

column 9, lines 38-46, which shows stub objects in addition to the original, real objects, and column 10, lines 14-35, which shows generating an SX_DELETE instruction to call a delete function, i.e. a destruction instruction routine, to destruct the objects after execution).

Although Meyer discloses that the object-oriented program is to be distributed and executed over a plurality of processes, as presented above, Meyer does not expressly disclose the limitation wherein the execution statement is to be executed in parallel or in a parallelization directive.

However, Martin discloses an analogous compiler for a distributed object system (see, for example, the abstract), and discloses source code that includes class-type variables and comments (see, for example, column 7, lines 34-39). The comments are specifications for parallelization and are thus parallelization directives (see, for example, column 7, line 50 to column 8, line 5, and column 8, lines 54-63). When an object of a class is to be executed in parallel, the system generates constructor code to instantiate a number of the objects in additional to the original (see, for example, column 9, lines 48-54). This is done to ensure high availability of the object (see, for example, column 9, lines 35-38). Martin further discloses that the system may be integrated with a conventional compiler (see, for example, column 2, lines 25-29).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to supplement the compiler of Meyer with the distributed object features of Martin, so that the object-oriented program to be distributed and executed over a plurality of processes, as taught by Meyer, can be compiled for parallel execution to ensure high availability, as taught by Martin.

With respect to claim 2 (currently amended), the rejection of claim 1 is incorporated, and

Meyer in view of Martin further discloses:

when generating an intermediate language from said source program (see, for example,

column 6, lines 34-48, which shows generating a protocol information file, i.e. an intermediate

language, from the source code),

(a) allocating a construction and destruction instruction information region in the

intermediate language of the class, when a class-type variable which has possibility to be

executed in parallel is specified (see, for example, column 10, lines 36-44, which shows

allocating in the protocol information file a region for method information, including

constructors and destructors); and

(b) storing into said construction and destruction instruction information region,

information concerning said construction instruction routine and said destruction instruction

routine of an object of the class (see, for example, column 10, lines 45-59, which shows storing

information concerning the methods or routines of the classes), and

wherein information stored in said construction and destruction instruction information

region is used in said steps of generating said instruction to call said construction instruction

routine and generating of said instruction to call said destruction instruction routine (see, for

example, column 10, lines 60-65, which shows that the method information is used when

generating the instructions).

With respect to claim 3 (currently amended), the rejection of claim 2 is incorporated, and

Meyer in view of Martin further discloses the limitation wherein said construction and

destruction instruction information region is linked from a type information region storing a

construction and destruction instruction information region index, and said type information

region is linked from a class information region storing a type information region index (see, for

example, column 10, lines 48-59, which shows class information linked to parameter type

information linked to the method information, and which shows that the information is indexed

by name and by a method identification), and when a class is identified, an access is performed

from said class information region to said construction and destruction instruction information

region via said type information region (see, for example, column 10, lines 36-48, which shows

accessing the information to identify a class and its methods, including constructors and

destructors).

With respect to claim 5 (currently amended), the limitations recited in claim 5 are

analogous to those of claim 1 (see the rejection of claim 1 above).

With respect to claim 6 (currently amended), the limitations recited in claim 6 are

analogous to those of claim 2 (see the rejection of claim 2 above).

With respect to claim 7 (currently amended), the limitations recited in claim 7 are

analogous to those of claim 3 (see the rejection of claim 3 above).

With respect to claim 9 (currently amended), the limitations recited in claim 9 are

analogous to those of claim 1 (see the rejection of claim 1 above).

With respect to claim 10 (currently amended), the limitations recited in claim 10 are

analogous to those of claim 2 (see the rejection of claim 2 above).

With respect to claim 11 (currently amended), the limitations recited in claim 11 are

analogous to those of claim 3 (see the rejection of claim 3 above).

7.   Claims 4, 8 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meyer

in view of Martin, as applied to claims 1, 5 and 9 above, respectively, and further in view of U.S.

Pat. No. 5,452,461 to Umekita et al. (art of record, "Umekita").

With respect to claim 4 (original), although Meyer discloses compiling an object-oriented

program to distribute it over a plurality of processes (see, for example, column 5, lines 28-32 and

46-47), and although Martin discloses a compiler for a distributed system (see, for example,

column 4, lines 15-20), Meyer in view of Martin does not expressly disclose the limitation

wherein said compiler is a compiler for a parallel computer with shared memory.

However, Umekita discloses a compiler for a parallel computer with shared memory (see,

for example, parallel compiler 213 in FIG. 27, and column 5, lines 30-27, which shows a

computer having a plurality of processors and shared memory), for parallelizing a source

program so that it may be executed in parallel with high efficiency (see, for example, column 1,

lines 41-53).

It would have been obvious to one of ordinary skill in the art at the time the invention

was made to implement the system of Meyer and Martin in a parallel computer with shared

memory, such as taught by Umekita, so as to achieve high efficiency.

With respect to claims 8 and 12 (original), the limitations recited in claims 8 and 12 are

analogous to those of claim 4 (see the rejection of claim 4 above).

Conclusion

8.   The prior art made of record and not relied upon is considered pertinent to Applicant's

disclosure. U.S. Pat. No. 5,598,561 to Funaki discloses an optimizing compiler which generates

multiple instruction streams to be executed in parallel. U.S. Pat. No. 5,737,605 to Cunningham

et al. discloses a data processing system for sharing instances of objects with multiple processes.

9.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Michael J. Yigdall whose telephone number is (571) 272-3707.

The examiner can normally be reached on Monday through Friday from 7:30am to 4:00pm.

   If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Tuan Q. Dam can be reached on (571) 272-3695. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

   Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private

PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MY

Michael J. Yigdall
Examiner
Art Unit 2192

mjy

TUAN DAM
SUPERVISORY PATENT EXAMINER